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This paper investigated the longitudinal study skills trajectories of college students with and without ADHD. Data were drawn from a large federally funded multi-site study, known as the Trajectories Related to ADHD in College (TRAC) project. A total of 456 first year college students started the project and were assessed annually across four years in North Carolina, Pennsylvania, and Rhode Island. Data from years 1-3 were available for the current study, which used ADHD group status, service utilization, and race/ethnicity to predict differences in study skills at baseline and change-over-time. Latent growth curve modeling was used to map out the trajectories of study skills, as measured by comprehension monitoring strategies (CMS), which is comprised of three subscales of the Learning and Study Strategies Inventory (LASSI). It was expected that students with ADHD would have worse CMS scores than non-ADHD comparison students, that service use would predict CMS scores, and that there would be differences in both CMS scores and service utilization as a function of dichotomized race/ethnicity. Results revealed that students with ADHD had worse educational skills at baseline and change-over-time. ADHD group status moderated the relationship between service utilization and CMS, such that increases in service utilization predicted increased trajectories of CMS scores for students with ADHD only. No differences in service utilization or CMS scores at baseline or change-over-time were observed as a function of

race/ethnicity. Implications for college services and ADHD treatment programs were discussed.

TRAJECTORIES OF COLLEGE STUDENTS WITH AND WITHOUT ATTENTION DEFICIT/HYPERACTIVITY DISORDER: THE IMPACT OF SERVICE UTILIZATION AND RACE/ETHNICITY ON STUDY SKILLS

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CHAPTER I

INTRODUCTION

Attention-deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder distinguished by deficits in inattention and/or hyperactivity-impulsivity (American Psychological Association, 2013). An estimated 5% of children are diagnosed with ADHD in the United States (APA, 2013). Although ADHD has often been thought about as a childhood disorder, it has been shown to be chronic in nature, persisting through childhood into adolescence and adulthood. In contrast with the wealth of research that has been conducted with children and adults with ADHD, much less is known for individuals with ADHD in the developmental stage of life known as emerging adulthood (i.e., 18 to 25 years of age; Arnett, 2007). Most of what is known about emerging adults with ADHD comes from studies involving college students (Weyandt and DuPaul, 2013), which is a relatively new literature based upon a very limited number of youth with ADHD (20%) who go on to matriculate in secondary educational institutions (Barkley, Murphy, & Fischer, 2008).

Transition to College

Individuals with ADHD who do matriculate into college settings have more educational challenges relative to their non-ADHD peers (Barkley, Murphy, & Fischer, 2008). Although the exact cause of these deficits remains unclear, many speculate that it is the result of deficits in self-regulation that are greater for college students with ADHD

than for college students without the disorder. Every college student is faced with new challenges that were not present in high school, such as increased responsibility, following a variable schedule, and navigating the autonomy to choose when to complete certain tasks (Wolf, Simkowitz, & Carlson, 2009). These new challenges require increases in self-regulation, and may prove to be stressful and overwhelming for all students. College students with ADHD, however, may face additional challenges as a result of having a deficit in self-regulation related to the disorder (Barkley, 2014). Therefore, although all students may need to adapt and enhance their self-regulation skills to meet the demands of college, students with ADHD have a much larger gap to fill in order to reach these demands. This phenomenon has been described as a "perfect storm," evidenced by increased demands for self-regulation with the new challenges of college, coupled with the fact that students are no longer maintaining extensive support systems for managing ADHD, such as individualized educational plans and parental monitoring (Anastopoulos & King, 2015).

Empirical Findings

In line with the "perfect storm" conceptualization (Anastopoulos & King, 2015) are numerous research findings demonstrating the difficulties associated with ADHD in college. Compared to those without ADHD, individuals with the disorder are less likely to attend four-year colleges as opposed to two-year colleges and vocational training programs (Kuriyan et al., 2013). Additionally, educational deficits related to ADHD have been documented for high school and college students who were and were not taking medication for the disorder (Advokat, Lane, & Luo, 2011). For example, Gormley,

DuPaul, Weyandt, and Anastopoulos (2016) found that students without ADHD maintained higher GPAs in high school, as well as during both fall and spring semesters of their first year in college. High school GPA was predictive of first-year college students' GPA irrespective of ADHD status, and females had higher average GPAs than males in both the ADHD and comparison groups (Gormley et al., 2016). Structural equation modeling was used to show that students with ADHD received lower GPAs than their non-ADHD counterparts during their first year of college (Gormley et al., 2015). Students with ADHD have also been found to have worse overall adjustment to college (Shaw-Zirt, et al., 2005) and more concern for academic difficulties during their first semester as a college student than their non-ADHD peers (Rabiner, Anastopoulos, Costello, Hoyle, & Swartwelder, 2008).

Less successful academic performance has been well documented, with grades for students with ADHD found to be on average one letter grade below students without the disorder (Weyandt et al., 2013; APA, 2013; Weyandt & DuPaul, 2008; Advokat et al., 2011; Blase et al., 2009). Higher levels of ADHD symptoms, especially symptoms of inattention, have been linked with lower GPAs (Schwanz, Palm, & Brallier, 2007) and with lower levels of academic skills, including studying habits (Norwalk, Norvilitis, & MacLean, 2009).

Psychosocial study skills factors, such as academic self-efficacy and achievement motivation, predicted educational outcomes in a sample of college students without documented psychological disorders (Robbins, Lauver, Davis, Langley, & Carlstrom, 2004); however, these study skills have been reported as deficits for college students with

ADHD (Gormley et al., 2015; Weyandt et al., 2013; Reaser et al., 2007). Lower study skills as measured by the Learning and Study Strategies Inventory (LASSI; Weinstein & Palmer, 2002) have been found to mediate the pathway between ADHD and GPA deficits (Gormley et al., 2015). Students with ADHD reported study skills and organizational habits that were less effective than their non-ADHD peers (Gormley et al., 2015), even demonstrating average deficits two standard deviations below controls (Weyandt et al., 2013). Additionally, reports of worse skills related to planning, note taking, focusing in class, completing class work (Advokat et al., 2011), concentration, selecting main ideas, and testing strategies (Reaser et al., 2007) have been detailed in the literature. Students with ADHD also report worse time management skills (Reaser et al., 2007), which could help explain academic deficits because time management has been shown to positively correlate with academic success for students with ADHD (Kaminiski et al., 2006).

Generally speaking, these study skill factors were better predictors of educational outcomes in college than high school GPA and socioeconomic status in a normative sample (Robbins et al., 2004), suggesting that shortfalls in study skills for those with ADHD may be exceptionally harmful to educational outcomes. Furthermore, these study skill factors have been shown to mediate the relationship between ADHD and GPA (Gormley et al., 2015), which provides a conceptual basis to investigate more proximal processes related to educational outcomes through study skills in the current study.

In review, college students with ADHD are at increased risk for experiencing negative educational outcomes, (e.g., lower grade point averages; Weyandt et al., 2013), which appear to be mediated by study skills factors (Gormley et al., 2015). Such

academic difficulties very likely help to explain why individuals with ADHD complete less schooling (APA, 2013) and why fewer college students with ADHD ultimately graduate with a degree compared to those without the disorder (Kuriyan et al., 2013).

Campus Services Utilization and Student Engagement

Upon closer examination, it is clear that much of the current literature has thus far failed to conceptualize and control for the impact of receiving treatment services. Intuitively, a college student with ADHD receiving treatment through campus or mental health services, such as academic skills, disability offices, or medication, might be expected to have more positive educational outcomes than students who are not utilizing these services. A study about attitudes toward ADHD found that the majority of college students with ADHD believed that they had been offered the appropriate accommodations for their disorder on campus, but only approximately half of them were using campus resources and services (Chew, Jensen, & Rosen, 2009). If 50% of all students in the aforementioned studies investigating ADHD are utilizing campus resources, the findings may be largely confounded by various treatment services. Furthermore, there may be barriers to connecting with campus services for the students not using services, which could negatively influence their educational outcomes. Controlling for these treatment services in analyses will better elucidate the experiences of college students with and without ADHD.

To demonstrate the importance of campus resources, it has been found that using campus services and other support systems is beneficial for college students with ADHD (Meaux, Green, & Broussard, 2009), but there are some discrepancies in the student

experience for students with and without the disorder. For example, previous use of educational services in high school has predicted utilization of campus services in college (Gormley et al., 2016). Thus, students who were previously successful in high school despite ADHD (e.g. the 20% who were able to get accepted and matriculate into college; Barkley, 2008) may not seek the support they need with a more demanding and challenging college course load.

Similarly, the attitudes and understanding of ADHD from peers, faculty, and administrators can also impact students' experiences on campus and use of services. Vance and Weyandt (2008) explored the perceptions that college professors hold toward students with ADHD. A great deal of variability among professors' beliefs regarding the accommodations that should be provided to college students with ADHD was found. Approximately 25% of professors were not supportive of accepting alternative assignments or providing lecture notes to those with an ADHD diagnosis, and the majority of professors reported never receiving any ADHD-related training (Vance & Weyandt, 2008). This variability among professors' willingness, experience, and enthusiasm to support and accommodate students with ADHD may act as a barrier to students seeking out and utilizing support services.

In summary, utilizing campus services may promote positive educational outcomes for college students. Very few studies to date, however, have investigated the impact that service utilization has in predicting educational outcomes for students with ADHD. Understanding the importance of utilizing campus services is of utmost importance for research investigating the experiences of college students with ADHD.

Educational Outcomes and Service Utilization for Students of Color

Although ADHD may predict some service use in college, a diagnosis of ADHD may not be the only factor impacting students' college experience. In both ADHD and general population samples, race and ethnicity have emerged as factors that potentially may impact service use. For example, one study found that students of color utilized campus resources at a higher rate than White students in a sample of first-year college students with and without ADHD (Gormley et al., 2016). Hu and Kuh (2002) collected questionnaire data about college experiences from a large general sample of 50,883 undergraduate students to investigate student engagement at post-secondary institutions. They found that Black students were more likely than White students to be engaged with college, measured by students' participation in "educationally purposeful activities", such as studying and interacting with faculty members (Hu & Kuh, 2002, p. 555). Furthermore, community college students from African American backgrounds interacted with faculty members, evidenced by visiting office hours, or having face-to face conversations before or after class, more often than European American, Latino, and Asian American/Pacific Islander students, respectively (Chang, 2005).

In contrast to these findings that students of color may be more engaged on campus and more likely to interact with faculty (Chang, 2005; Gormley et al., 2015), Schwitzer et al. (1999) found that Black students studying at university campuses comprised predominantly of White students expressed feelings of underrepresentation and believed that there were hurdles to approaching faculty (Schwitzer et al., 1999). Students revealed feeling more comfortable approaching faculty members within their

major, racial group, or gender, but stated that it was difficult to find and connect with faculty members within their minority backgrounds on campus (Schwitzer et al., 1999). Maintaining these connections with professors is highly important for students of color because higher ratings of college satisfaction were related to having more ties with professors for Black and Hispanic students (Fischer, 2007).

Furthermore, the variability in professors' attitudes about ADHD and accommodations that was previously mentioned (Vance & Weyandt, 2008) may add to difficulties that have been reported by college students of color regarding faculty-student interaction (Schwitzer et al., 1999) for students of color who also have ADHD. Conversely, if students of color are utilizing campus services (Gormley et al., 2016) and interacting with faculty more frequently (Hu & Kuh, 2002; Chang, 2005), there may be protective factors that promote positive educational outcomes.

Although there is limited research related to campus services utilization, even fewer studies have examined educational differences for college students of color. Palacios and Alvarez (2015) found that African American and Latino men self-reported lower GPAs than White men in a community college sample. Additionally, maintaining many off-campus ties, such as staying connected with close friends off campus and often visiting home, was detrimental to GPA for European American and African American students, but not to Asian American or Hispanic students (Fisher, 2007). Based on the limited current literature, it is plausible that there are disparities in GPA among students of different racial/ethnic backgrounds, although the literature is notably scarce and few predictors have been examined to explain some of the variance in these differences.

In review, relatively few studies have investigated campus services utilization among college students with ADHD, and there are no known studies addressing the impact that service utilization may have on college students of color with ADHD. It is evident that engaging in different services on campus, or receiving ADHD treatment, may impact educational experiences. Educational outcomes related to ADHD, therefore, should be investigated in conjunction with service utilization and race/ethnicity to better portray the unique experiences of college students with ADHD.

Summary and Critique of the Literature

Emerging adults with ADHD are an at risk population, which is evidenced by their difficulties in post-secondary educational settings. Although it has been demonstrated that ADHD is a neurodevelopmental disorder (APA, 2013) that persists into adulthood (Barkley, 2008), few studies have examined the developmental period of emerging adulthood for individuals with ADHD via a longitudinal study design. The few studies that have investigated the experiences of college students with ADHD have been limited by cross-sectional research methodologies that may distort the findings. Using data collected at a single time point drastically limits the applicability of the findings and generalizability to other college students with ADHD. Therefore, cross-sectional studies may misrepresent the experiences of college students at different stages (e.g., a first-year student may have different challenges than a senior). No well-designed longitudinal studies to date have investigated the educational outcomes for college students with ADHD beginning with their matriculation into college. Similarly, these studies have often failed to consider the impact of receiving treatment for their disorder, or assistance

with academic skills, by utilizing campus services. There are likely many educational differences between students with ADHD who are seeking out and utilizing services on campus and students who are not.

Additionally, there is a great deal of variability in the educational indices used to assess the educational achievement of students. For example, many studies have simply investigated the differences in GPA among college students with and without ADHD, while others have investigated study skills and other academically related proficiencies. The variability in this conceptualization of educational achievement may confound the experiences and outcomes of students with ADHD. Few studies to date have controlled for students' year in college, co-occurring psychological disorders, treatment services, or the variability in educational outcome measures, such as the LASSI, GPA, or other academic skills.

In addition to these concerns, there is a gap in the literature pertaining to differences between students with and without ADHD across lines of race/ethnicity[1]. Empirical studies investigating the role of race/ethnicity as potential predictive, moderating, and/or mediating factors related to ADHD in college are almost nonexistent. It has become increasingly important to understand the experiences of college students with ADHD from less privileged backgrounds. There is a notable dearth in the literature considering the role that race/ethnicity plays in the trajectories of college students with and without ADHD. Very few studies have explicitly addressed race/ethnicity with ADHD in samples of college students to assess educational, behavioral, social, or other

functional outcomes. The current literature does not sufficiently explain the experiences of any college students with ADHD, let alone students of color.

Clarification of this issue is important because deficits in educational outcomes related to race/ethnicity have previously been documented for students without ADHD (Palacios & Alvarez, 2015; Fisher, 2007). These deficits associated with race/ethnicity may amplify the difficulties experienced by college students with ADHD. Connecting the literature related to college experiences for students with ADHD, campus service utilization, and students of color has provided a conceptual basis for the current study. It is clear that students with ADHD will have educational difficulties in college (Kuriyan et al., 2013; Weyandt & DuPaul, 2008). It is also plausible that students of color may have some difficulties related to college educational outcomes (Palacios & Alvarez, 2015; Fischer, 2007). What needs to be examined, however, is how these difficulties related to college experiences and campus service utilization will manifest for students of color who also have ADHD. Using longitudinal data to better demonstrate the educational trajectories of college students with and without ADHD is needed to supplement what little is known from previous cross-sectional studies. Expanding knowledge about differences in service utilization for college students of color will potentially provide paramount information for college campus services and intervention programs. Examining the relationship between race/ethnicity and educational outcomes among college students with and without ADHD will add to the relatively sparse literature in this area. Understanding the relationship among service use and race/ethnicity may help

reduce barriers to services that provide additional supports, knowledge, and strategies for students struggling to manage ADHD in college.

The current study will attempt to add to the literature by using longitudinal data, investigating the impact of ADHD group status, service utilization, and race/ethnicity to examine study skills for emerging adults with and without ADHD.

Current Study

The current study aimed to examine the impact of service utilization and race/ethnicity on previously reported educational study skills for college students with ADHD. In light of previous findings that study skills mediate the relationship between ADHD and GPA (Gormley et al., 2015), it was decided to use study skills, as measured by the Learning and Study Strategies Inventory (LASSI), as the latent outcome variable in the current study. No known studies to date have investigated the predictive power of service utilization and race/ethnicity on longitudinal trajectories of college students with and without ADHD.

The following research questions and hypotheses were addressed:

1. Are there differences in the study skills trajectories for college students across time as a function of ADHD group status, service utilization, and race/ethnicity?

    H1a: It was expected that the study skills for college students with ADHD would be worse than the study skills for college students without ADHD and that these disparities would be stable across time.

H1b: It was anticipated that higher reports of service utilization would be associated with higher study skills trajectories for college students with and without ADHD.

H1c: It was hypothesized that students of color would utilize campus services at different rates that students from the majority non-Hispanic European American backgrounds for both students with and without ADHD.

H1d: Considering the educational difficulties associated with ADHD diagnoses and the mixed literature on educational difficulties associated with race/ethnicity, it was hypothesized that students of color with ADHD would have worse study skills than their non-Hispanic White counterparts with and without ADHD.

2. To what extent does ADHD group status moderate the association between changes in service utilization and study skills trajectories?

H2: It was expected that changes in college services utilization would differentially predict study skills trajectories over time for college students in the ADHD group and comparison group.

3. Is there an association between disability services utilization (i.e. those only available to students with a documented disability) among college students with ADHD and study skills trajectories?

H3: It was expected that there would be a relationship between using disability services and study skills for college students with ADHD.

CHAPTER II

METHODS

Data for this study was drawn from the Trajectories Related to ADHD in College (TRAC) project. TRAC is a longitudinal study examining the four-year trajectories of 456 first-year college students with and without ADHD from multiple public and private colleges in North Carolina, Pennsylvania, and Rhode Island. A 5-year National Institute of Health (NIH) grant (5R01MH094435-05) awarded to Dr. Anastopoulos from the University of North Carolina at Greensboro, Dr. DuPaul from Lehigh University, and Dr. Weyandt from the University of Rhode Island provided funding for TRAC, which is in its fifth and final year of support.

Participants

A total of 527 students were initially screened, from which 456 participants met eligibility requirements and participated in the TRAC study. Participants ranged in age from 18-22 years old and were first-year college students from each of the various college campus research sites at the beginning of the study. 51.8% of the participants identified as female. Participants self-reported their racial composition as follows: 71.1% European American, 12.6% African American, 5.6% Asian American, 3.8% multiracial, and 6.8% indicating other racial backgrounds. Additionally, 10.6% of the sample reported Hispanic backgrounds. When viewing race and ethnicity together, 67.5% of the total sample reported being non-Hispanic White students (See Table 1 for demographics

by group status and assessment site). Eligibility was assessed through multiple screening procedures designed to ascertain diagnostic status for ADHD based on criteria from the *Diagnostic and Statistical Manual of Mental Disorders-5* (*DSM*-5; APA, 2013). A diagnosis of ADHD requires that five major criteria be met. For example, there is a symptom frequency criterion requiring that at least five out of nine inattention symptoms or five or more out of nine hyperactivity-impulsivity symptoms have been present and occurring frequently for at least six months. It must be clear that these symptoms cause impairment that impacts functioning in academic, social, or occupational domains. Additionally, symptoms must be present in multiple settings, and some should have been evident during childhood before the age of twelve. Finally, it is also necessary to rule out other medical or mental health conditions as possible sources of the symptoms and associated impairment.

During the first of a two-stage screening process, participants were given the ADHD Rating Scale (DuPaul, Power, Anastopoulos, & Reid, 1998) to assess their self-reported ADHD symptomatology during childhood and the last six months. Parents were also asked to complete these measures about their child's childhood and present symptoms. Subsequently, a semi-structured interview to assess adult ADHD and the Structured Clinical Interview for DSM Disorders (SCID-I; First, Gibbon, Spitzer, & Williams, 2002) were conducted to assess ADHD status and any present co-occurring, or comorbid disorders. Cases were then reviewed by a four person PhD-level expert panel, whose unanimous agreement was necessary for determination of ADHD and non-ADHD psychiatric status and for assignment to groups. Participants endorsed by the panel as

meeting DSM-5 criteria for ADHD were assigned to the ADHD group. Participants reporting three or fewer symptoms of both inattention and hyperactivity impulsivity during childhood and currently were assigned to the comparison group.

Procedures

Two cohorts of participants (n=219 in cohort 1, n=237 in cohort 2) were successfully recruited over a two-year period via disability services offices, summer freshman orientation sessions, presentations to first-year student classes, and fliers around each respective campus. Eligible participants were asked to complete an annual assessment that was conducted by pre-doctoral students and doctoral-level staff at each site. In addition to the initial 2-stage screening procedures, these annual evaluations included two additional assessment stages in which data were collected addressing executive, psychological, social, educational, and vocational functioning, along with service utilization. Each assessment required 3-6 hours of participants' time. Participants had the opportunity to receive up to $100 for completing all required assessments. Study procedures were reviewed and approved by the Institutional Review Board at each site annually and all participants provided informed consent for all procedures. For a full explanation of TRAC procedures, see Anastopoulos et al. (2016).

Complete data collected from three years of assessment for each cohort were used in this study to investigate the role that service utilization and race/ethnicity play in the relationship between ADHD and study skills.

Measures

Learning and Study Strategies Inventory (LASSI). The second edition Learning and Study Strategies Inventory (LASSI) is a self-report measure designed to measure participants "use of learning and study strategies related to skill, will, and self-regulation components of strategic learning" (Weinstein & Palmer, 2002, p. 4). The LASSI contains a total of 80 items that are scored on a Likert-scale about how well the statement describes them (i.e. *a = not at all typical of me… e = very typical of me).* The LASSI yields ten subscales including Anxiety, Attitude, Concentration, Information Processing, Motivation, Selecting Main Ideas, Self-Testing, Study Aids, Test Strategies, and Time Management. Overall, the LASSI has adequate internal consistency and reliability with Cronbach's alphas for each of the ten scales ranging from .73 to .89.

For the purposes of this study, three subscales of the LASSI served as the outcome variable. Preliminary confirmatory factor analyses in M*plus* using the correlation matrix, standard deviations, and sample size from the LASSI User's Manual (Weinstein & Palmer, 2002) found that the LASSI is likely a multidimensional scale measuring three separate factors. These higher order factors or latent variables were originally termed affective strategies, goal strategies, and comprehension monitoring strategies (Cano, 2006). The affective strategies factor represented the LASSI subscales time management, motivation, concentration, and attitude (Cano, 2006). The goal strategies factor was comprised of anxiety, test strategies, and selecting main ideas (Cano, 2006). Lastly, the comprehension monitoring strategies contained the subscales information processing, self-testing, and study aids (Cano, 2006). This factor structure

also had some overlap (i.e. subscales associated with multiple higher order latent variables), but this was determined to be the best model fit for Cano's (2006) sample of 527 first year college students at the University of Granada (Spain). For the purposes of this study, the latent variable comprehension monitoring strategies (CMS) comprised of the information processing, self-testing, and study aids subscales of the LASSI was used because it was hypothesized that this factor would be more strongly related to educational differences among college students with and without ADHD.

College Services Questionnaire. The Services for College Students Interview-College Version (SCSI) is a self-report measure that was created for use in the TRAC study (see Appendix C). Students were asked to report on the services they use (e.g. tutoring, disability accommodations). Participants reported frequency of use, helpfulness of service, and duration of service utilization. The first five items of the SCSI were representative of services available to all college students irrespective of diagnostic status, including meeting with a professor or advisor, receiving campus tutoring, academic skills, or help from the writing or speaking centers, and career counseling. In the current study these items were termed *educational services.* Four additional SCSI items were pertinent only to students with a documented diagnosis, entitling them to disability services accommodations, taking medication for ADHD or another mental health condition, and receiving psychosocial treatment such as individual therapy. These SCSI items were termed *disability* services. In the current study, educational services were used to predict any differences in CMS over time for students with and without

ADHD and disability services were used to predict any additional differences in CMS scores over time as a function of disability-related services in the ADHD group only.

Data Analytic Plan

At the time of the current study, three assessment years of longitudinal TRAC data were available for use. Data used in the current analyses were collected annually at intervals corresponding with the academic semesters in which they started TRAC. These times points correspond with the factor loadings for the intercept in the growth model. Data from twenty-six participants were removed prior to analyses due to missing LASSI and SCSI data, resulting in an N=430. New variables were created to represent dichotomized race/ethnicity, and all variables were recoded to 0-1 for analysis.

To first confirm previous findings that the LASSI is a multidimensional measure with three underlying constructs (i.e. CMS, goal strategies, affective strategies; Cano, 2006), two confirmatory factor analyses were conducted. The first analysis used the correlation matrix from the LASSI User's Manual (Weinstein & Palmer, 2002) and the second analysis utilized raw data from the current study.

Latent growth curve modeling was initially used to assess the change in CMS over time (see Figure 1 for a path diagram of the latent growth curve model). Latent growth curve modeling is a statistical procedure used to assess the change in continuous variables over time (Preacher, Wichman, MacCallum, & Briggs, 2008). Using longitudinal data with at least three time points, the basic growth model maps out the average change in the latent variable over time. If there is variability in the change of the latent variable, it can be regressed onto predictor variables to assess any differences in the

intercept (baseline scores of the latent variable) and slope (change in the latent variable over time) (Preacher et al., 2008; Little, Card, Preacher, & McConnell, 2009).

In the current study, the predictor variables ADHD group status, service utilization, and race/ethnicity were used to examine any differences in CMS at baseline and/or change over time for college students with and without ADHD. The longitudinal scores on the three subscales of the LASSI, information processing, self-testing, and study aids were used to map out the average change in CMS over three time points (year 1 - year 3) for each group. M*plus* was used to create a latent variable for CMS from the three subscales at each time point rather than simply using the sums or averages of CMS scores. Factor scores representing the overall weighted scores for the CMS at each time point were saved out using M*plus*. Because the factor loadings for CMS were constrained to represent baseline and change-over-time, the factor scores simply represent weighted averages in CMS scores over time. The latent variable was then regressed onto ADHD-status, service utilization, and the dichotomized race/ethnicity variable as potential predictor variables of CMS baseline scores and change over time. For service utilization, two latent variables were created in M*plus*. The first variable, educational services utilization, summarized the use of campus support services available to any students (e.g. tutoring). The second variable, disability services utilization, summarized the use of support services available only to students who have a documented diagnosis, such as ADHD, entitling them to disability services, or prescription medication, for example. Factor scores for these service utilization variables were also saved out to represent weighted scores at each time point. These factor scores were then converted to latent

change scores to represent the weighted change in service utilization from year one to year three. Service utilization data from year two was not included in the latent change scores because it was highly correlated with year three ($r = 0.99$). Therefore, latent change scores for services represent differences in service utilization across the entire duration of the study (i.e. baseline to year three), corresponding with the beginning and end of the growth curve.

The newly created latent change scores were used to determine if there were any differences in CMS as a function of service utilization among college students with and without ADHD across time. The growth model was regressed on the latent change score for educational services utilization to potentially predict changes in CMS for all students with and without ADHD. Multi-group analyses were also conducted to investigate if ADHD-status moderated any change in CMS as a function of changes in educational services utilization.

In contrast, the latent change score for disability services utilization was used to assess any changes in CMS as a function of changes in service use only among the group of students with ADHD. Additionally, it was assessed if race/ethnicity significantly predicted differences in services utilization. All analyses were conducted in M*Plus*.

CHAPTER III

RESULTS

LASSI Factor Structure

A confirmatory factor analysis using the correlation matrix from the LASSI User's Manual (Weinstein & Palmer, 2002) was first conducted to confirm previous findings that the LASSI is a multidimensional assessment tool measuring three different constructs (i.e. comprehension monitoring strategies (CMS), affective strategies, and goal strategies) (Cano, 2006). Acceptable model fit was found, $\chi 2$ (31, N = 1092) = 314.952, p = 0.00, CFI = 0.954, RMSEA = 0.092, 90% CI [0.083, 0.101]. Additionally, a confirmatory factor analysis using raw data from the current TRAC study was conducted, $\chi 2$ (31, N = 430) = 172.242, p = 0.00, CFI = 0.950, RMSEA = 0.104, 90% CI [0.089, 0.119]. The results from the raw data were almost identical to that from the correlation matrix in the LASSI user manual. It should be noted that in both analyses, model fit increased when multiple subscales were factor loaded onto multiple higher order constructs. The subscales, however, did not impact the higher order construct, CMS. Therefore, a CFA using only the subscales that factor onto the higher order construct that were to be used in the current study was conducted. This model demonstrated exceptional model fit, $\chi 2$ (15, N = 430) = 11.26, p = 0.734, CFI = 1.00, RMSEA = 0.00, 90% CI [0.00, 0.03]. These analyses supported multidimensionality of the LASSI and confirmed the decision to choose one latent construct under the LASSI and use it as a manifest

outcome variable for the latent growth curve analyses rather than summing entire LASSI scores at each time point. CMS scores represent the summation of the three subscales of the LASSI that factor loaded onto the CMS construct; information processing, study aids, and self-testing. These scores were then transformed into factor scores to provide a more accurate, weighted summation of CMS scores over time.

Latent Growth Curve Model Analysis

To address the research questions, three separate latent growth curve models were created (see Table 2 for basic results by model). The first basic model investigated the change in CMS scores over time and analyzed predictors, including ADHD group status, educational service utilization, and race/ethnicity. The second multi-group model was used to assess if ADHD group status moderated the association between educational service utilization and CMS baseline and change over time. Lastly, a model aimed at investigating the role of utilizing disability services on campus, which are only available to students with a documented disability, was analyzed. In each model, latent difference scores were created to represent the change in service utilization from assessment year one to assessment year three for the educational and disability services variables.

First, to assess the change in CMS over time for college students with and without ADHD, a basic latent growth curve model was created (see Figure 1). The factor loadings for the model represented the three assessment years of data collection (i.e. at baseline and each following year). The growth model had acceptable model fit ($\chi 2$ (9, N = 430) = 15.016, p = .091, CFI = 1.00, RMSEA = .04, 90% CI [0.000, 0.073]). The model demonstrated that there was not a significant slope in CMS scores across

assessment years one through three (b = -0.061, p = 0.648). The growth model also showed significant variability in both the intercept (b = 21.650, p < 0.001) and slope (b = 1.993, p = 0.001) of CMS scores, which suggests that regressing intercept and slope factors onto predictors would help determine which covariates explained variability in both baseline and change-over-time CMS scores. The latent variable CMS was regressed onto three predictors to assess any differences, including ADHD group status, service utilization, and race/ethnicity. ADHD group status and race/ethnicity were also used as predictors of service utilization. Results revealed that those with ADHD had lower CMS scores than comparison students at baseline (b = -3.38, p = 0.000). Additionally, the slope was not significantly different as a function of ADHD group status (b = 0.07, p = 0.590), which suggests that the differences in CMS among students with and without ADHD observed at baseline may remain stable over time (see Figure 2 for the average change in CMS across time by group).

Next, this model revealed that students who utilized higher educational services on campus at baseline also had higher baseline CMS scores (b = 2.65, p = 0.000) and that students who increased their use of educational campus services also had increases in CMS trajectories (b = 0.70, p = 0.036).

Lastly, it was investigated if there were any differences in CMS scores as a function of race/ethnicity. Results revealed that there were no significant differences in CMS scores at baseline (b = 0.09, p = 0.859) or change over time (b = 0.07, p = 0.698) as a function of race/ethnicity. It was also analyzed if there was an association between the dichotomized race/ethnicity variable and service utilization for college students with and

without ADHD. Results revealed that there were no significant differences in latent difference scores of educational services utilization (b = -0.01, p = 0.475) as a function of race/ethnicity.

Because the first model revealed that service utilization was associated with higher CMS scores at baseline and over time, analyses were conducted to see if this association was in fact moderated by ADHD status, as hypothesized. A multi-group latent growth curve analysis to assess differences in CMS scores between students with and without ADHD across time was conducted (see Figures 3 and 4). Acceptable model fit for the multi-group analysis was found, $\chi 2$ (15, N = 430) =18.46, p = 0.239, CFI = 0.998, RMSEA = 0.033, 90% CI [0.000, 0.076]. The latent difference scores used in the previous model were again used as predictors of CMS scores in the multi-group growth model. Results revealed that increases in educational service utilization was predictive of increases in CMS scores for students with ADHD (b = 1.008, p = 0.010), but not for students without ADHD (b = 0.296, p = 0.596). That is, ADHD group status moderated the effect of services utilization on CMS scores. The multi-group model continued to support the earlier finding that there were not significant differences for CMS intercept or slope, or service utilization as a function of race/ethnicity.

Finally, a latent change model to assess the impact of changes in the utilization of disability services, which are only available to college students with a documented disability, on CMS scores at baseline and across time was analyzed (see Figure 5). This model demonstrated acceptable model fit, $\chi 2$ (8, N = 430) = 17.716, p = 0.235, CFI = 0.994, RMSEA = 0.053, 90% CI [0.019, 0.087]. These analyses regressed CMS scores

onto the latent change score for disability services utilization among the ADHD-group only. Results revealed that increases in disability services utilization among college students with ADHD were associated with decreases in the trajectory of CMS scores (b = -3.871, p = 0.003). Similarly, those that utilized more disability services at baseline also had lower CMS scores at baseline (b = -10.7, p = 0.008). In terms of race/ethnicity, results revealed that there were no significant differences in the latent difference scores for disability services utilization (b = -0.003, p = 0.577) as a function of race/ethnicity.

In summary, results revealed support for all hypotheses expect those related to race/ethnicity. College students with ADHD were found to have worse CMS scores at baseline than the comparison group, which stayed stable over time. Educational service utilization at baseline was associated with higher CMS scores at baseline. Similarly, increases in educational services utilization was associated with a higher trajectory of CMS scores for students with ADHD, but not for comparison students. Contrary to expectations, increases in disability services utilization was associated with a decreased trajectory of CMS scores for college students with ADHD. In regards to the hypotheses addressing race/ethnicity, no differences in CMS scores, or campus services utilization were found as a function of dichotomized race/ethnicity in any model.

CHAPTER IV

DISCUSSION

Studies investigating the impact of ADHD on college students have detailed extensive academic difficulties, such as lower GPAs (Weyandt et al., 2013) and less effective study skills (Gormley et al., 2015). Unclear from the existing literature, however, is the manner in which such educational deficits unfold across the college years and the degree to which factors other than ADHD may play a role. The purpose of the current study was to examine the potential impact of service utilization and race/ethnicity on the educational functioning of college students with and without ADHD across their first three years in college.

Based on the previous literature detailing academic difficulties for those with ADHD, it was hypothesized that college students with ADHD would have worse educational trajectories and outcomes than their non-ADHD counterparts. In support of this hypothesis, significant differences in study skills (as measured by LASSI CMS scores) for college students with and without ADHD were found at baseline. There was not a significant slope for the CMS variable for the entire sample, meaning that both groups had relatively stable CMS scores over time. Because there was very little change in CMS scores over time, and because ADHD group status did not significantly predict slope differences, it is likely that students with ADHD maintained consistently lower CMS scores, or educational skills, than their non-ADHD counterparts across time. This

finding is aligned with a wealth of research that has consistently demonstrated academic deficits for college students with ADHD (e.g. Weyandt et al., 2011; Gormley et al., 2015).

In addition to intercept differences between students with and without ADHD on CMS scores, there were also differences in CMS as a function of service utilization. Increases in educational service utilization (i.e., meeting with a professor or advisor, receiving campus tutoring, academic skills, help from the writing or speaking centers, and career counseling) predicted significant increases in CMS scores for the entire sample. The multi-group model, however, supported the hypothesis that ADHD group status would moderate the impact of educational service utilization on study skills trajectories measured by CMS scores. Increases in educational services utilization were associated with statistically significant increases in study skills for those diagnosed with ADHD, but not for the comparison group. This means that students with ADHD who increased their use of educational campus services from year one to year three, had significant increases in their study skills. It is unclear why only students with ADHD benefited from increases in educational services utilization. Perhaps this is because students without ADHD already had higher scores on the CMS, or already were using better study strategies, there was less room for those students to improve. This ceiling effect explanation could explain why only students with ADHD, who had lower CMS scores to begin with, saw improvements with increased use of educational services on campus.

Nonetheless, this finding for college students with ADHD is important for a couple reasons. First, although CMS scores remained fairly consistent over time, increases in educational service use also predicted increases in CMS scores. That means that students who increased their use of educational services on campus were able to change their study skills trajectory, which for most students remains very stable across time. Therefore, students struggling with study skills related to information processing, study aids, and self-testing may see significant improvements in their abilities after increasing their use of campus services. Similarly, this finding is important because it supports university efforts to encourage students with ADHD to include educational services as part of their overall clinical management plan. This finding is also aligned with previous research indicating that high achieving students with ADHD perceived that they studied longer and harder than their peers and needed to utilize more social supports to help them manage the disorder (Kaminiski et al., 2006). These findings may also suggest that to have educational success in college, students with ADHD must spend more time utilizing campus services, which may require them to sacrifice engagement in other activities.

In contrast with these findings related to educational services use, analyses looking only at disability services utilization (i.e., disability services accommodations, taking medication for ADHD or another mental health condition, and receiving psychosocial treatment such as individual therapy) revealed that increases in disability service utilization were associated with decreases in CMS over time. In other words, college students with ADHD who increased their use of disability services showed

decreases in their study skills over time. This unexpected finding raises the possibility that students with ADHD who are actively seeking campus services for disabilities may also be declining academically, which could have large implications for college services offices. For example, disability services offices may want to provide additional support to students using their services to help lessen the academic burden. This unexpected finding might also be the related to the higher rates of depression, anxiety, and other comorbid diagnoses that are commonly found among college students with ADHD (Anastopoulos et al., 2016). Students with ADHD who are diagnosed with additional psychological diagnoses may be experiencing additional stressors and hardships that further hinders their academic success.

In addition to educational and disability services predicting CMS scores, it was expected that there would be differences in service utilization among students from non-Hispanic White backgrounds and students of color. Prior research findings have been mixed with respect to discrepancies related to campus engagement and service use among students of color. Contrary to the hypothesis that students of color would utilize campus resources less often than students from non-Hispanic European American backgrounds, no differences were found in either educational college services utilization or disability services utilization as a function of dichotomized race/ethnicity. Similarly, no differences were found in study skills outcomes, measured by CMS scores at baseline and over time, as a function of dichotomized race/ethnicity for college students with or without ADHD. These findings run counter to the results of a previous study (Gormley et al., 2015), which found discrepancies in service use and campus resources across lines of race and

ethnicity, with students of color utilizing services more often than White students during their first year of college. One reason for this discrepancy may be due to the current study's dichotomization of race/ethnicity, as well as the longitudinal analyses of latent differences scores related to service utilization rather than simply using one time point. Dichotomizing race/ethnicity into non-Hispanic White students and students of color may mask any differences among individual racial and ethnic groups. The sample composition in the current study did not allow for separate analyses for each racial and ethnic group, but future analyses should parse out the racial/ethnic composition to better understand the impact of these variables in educational outcomes.

Although shedding new light on the educational functioning of college students with ADHD, the current findings should be interpreted and considered in the scope of the study's limitations. First, the observational nature of the study design does not allow for inferences regarding causality. The current study also utilized self-report data, which could be biased. Additionally, the current study analyzed educational services together as a single latent change variable, and disability services in the same manner. Future studies should further investigate educational outcome differences among students utilizing specific campus services (e.g., meeting with professors, using the writing center, connecting with disability services offices) rather than grouping them into larger subgroups of educational and disability services. It would be helpful for college services offices to know which of their educational and disability services are impacting students the most.

There are also limitations related to the overall TRAC sample. Due to its demographic composition, this study could not analyze each racial and ethnic group separately. Therefore, a dichotomized variable for race/ethnicity was created, which separated the sample into students of color and non-Hispanic White students. Although this dichotomization allowed for an investigation into some levels of advantage and disadvantage, it did not allow for a deeper investigation into the impact of various individual racial and ethnic groupings. The sample was also drawn from three university settings in the eastern United States, which could impact generalizability to other areas. College students living outside these regions may have different experiences related to ADHD and race/ethnicity that were not captured in the current study. Similarly, various colleges may offer slightly different educational services on campus, which could mean that the findings related to service utilization would not generalize well. Furthermore, analyses were conducted using data from all three sites together, although there could be geographical variations in the experiences for college students with ADHD, and differences in the racial composition of students at each site. For example, students of color with ADHD may have different experiences on college campuses in the southeast than they do in the northeast.

Even with such limitations, the current study has important implications for college campuses and ADHD intervention programs. For example, it is important to know that increases in educational services on campus are associated with increases in study skills trajectories for college students with ADHD. College campuses and intervention programs can use this information to increase efforts to connect students

with these services. Also, it is important to know that students with ADHD who are increasing their use of disability services may be struggling academically and may therefore require additional supports.

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APPENDIX A

FOOTNOTES

[1] Consistent with previous literature demonstrating differences in privilege among individuals from non-Hispanic White backgrounds and students of color (e.g. students from Hispanic, African American, or Asian American backgrounds) in educational settings (Kelly & McCann, 2014), it was decided to group individuals in this study dichotomously. For this reason, race and ethnicity was discussed as a unidimensional construct reflecting those from non-White racial *and/or* ethnic backgrounds, and those from non-Hispanic White backgrounds.

APPENDIX B

TABLES AND FIGURES

Table 1. Participant Demographic Information

	North Carolina		Rhode Island		Pennsylvania		Total Sample	
	ADHD	Comparison	ADHD	Comparison	ADHD	Comparison	ADHD Group	Comparison
	n = 85	n = 77	n = 55	n = 70	n = 72	n = 71	n = 212	n = 218
	% in group	% in group	% in group	% in group	% in group	% in group	% in group	% in group
Race/Ethnicity Dichotomized								
Non-Hispanic White	50 (58.8%)	35 (45.5%)	49 (89.1%)	52 (74.3%)	53 (73.6%)	51 (71.8%) (	152 (71.7%)	138 (63.3%)
Students of Color	35 (41.2%)	42 (54.5%)	6 (10.9%)	18 (25.7%)	19 (26.4%)	20 (28.2%)	60 (28.3%)	80 (36.7%)
Race								
European American	54 (63.5%)	35 (45.5%)	51 (92.7%)	55 (78.6%)	58 (80.6%)	53 (74.6%)	163 (76.9%)	143 (67.5%)
African American	24 (28.2%)	28 (36.4%)	0 (0%)	2 (2.9%)	1 (1.4%)	0 (0%)	25 (11.8%)	30 (13.8%)
Asian American	1 (1.2%)	2 (2.6%)	1 (1.8%)	6 (8.6%)	4 (5.6%)	11 (15.5%)	6 (2.8%)	19 (8.7%)
Multiple	2 (2.4%)	4 (5.2%)	1 (1.8%)	2 (2.9%)	4 (5.6%)	2 (4.9%)	7 (3.3%)	8 (3.7%)
Other/Not Reported	4 (4.7%)	8 (10.4%)	2 (3.6%)	5 (7.1%)	5 (6.9%)	5 (7.0%)	11 (5.2%)	18 (8.3%)
Ethnicity								
Hispanic	9 (10.6%)	7 (9.1%)	4 (7.3%)	9 (12.9%)	10 (13.9%)	7 (9.9%)	23 (10.8%)	23 (10.6%)
Non-Hispanic	76 (89.4%)	70 (90.9%)	51 (92.7%)	61 (87.1%)	62 (86.1%)	64 (90.1%)	189 (89.2%)	195 (89.4%)
Gender								
Female	49 (57.6%)	36 (46.8%)	33 (60%)	37 (52.9%)	31 (43.1%)	40 (56.3%)	113 (53.3%)	113 (51.8%)
Male	36 (42.4%)	41 (53.2%)	22 (40%)	33 (47.1%)	41 (56.9%)	31 (43.7%)	99 (46.7%)	105 (48.2%)

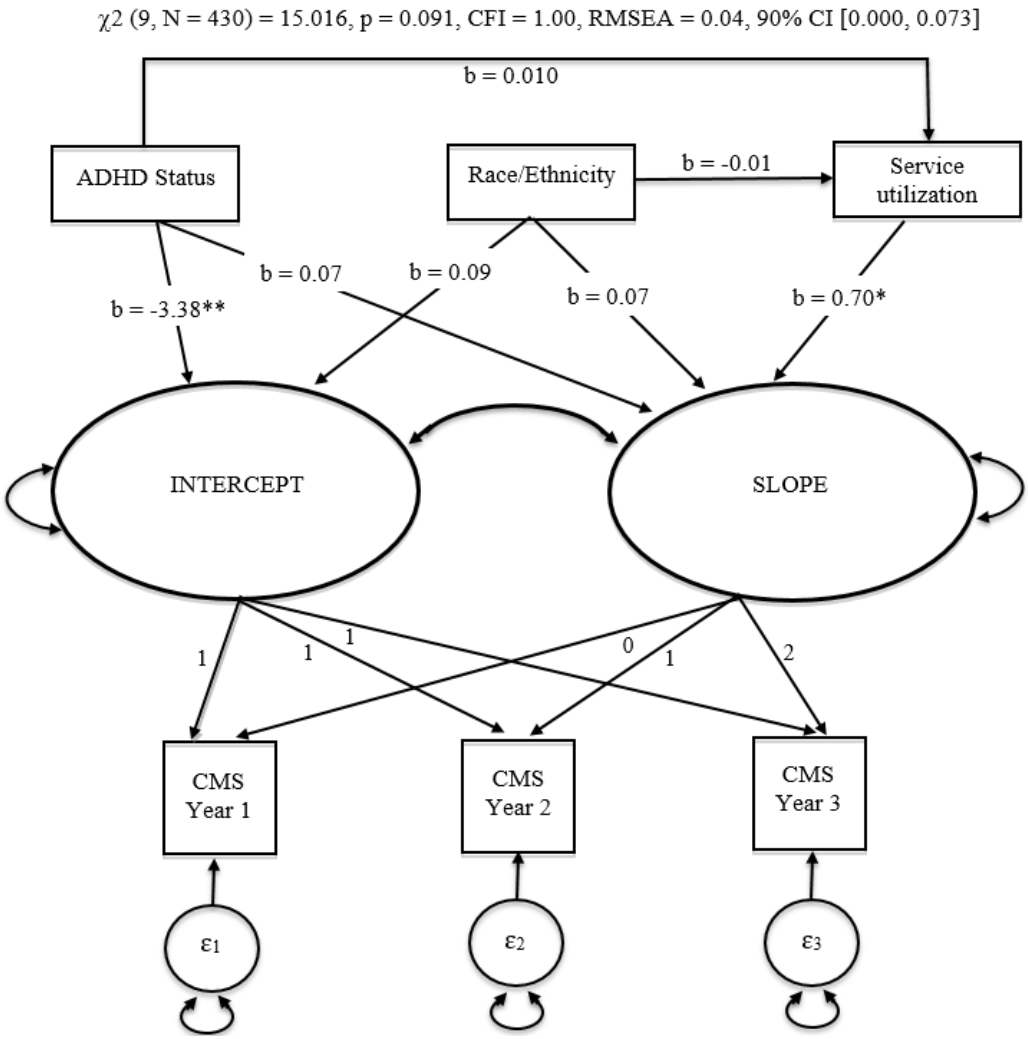
Table 2. Analyses by Model

	Model 1				Model 2: Comparison				Model 2: ADHD			
	b	SE	p-value	β	b	SE	p-value	β	b	SE	p-value	β
Slope	-0.061	0.133	0.648	-0.043	-0.079	0.162	0.624	0.338	0.059	0.122	0.629	-0.402
Slope with Intercept	-2.707	0.755	0.000	-0.412	-3.175	1.202	0.008	-0.404	-2.258	0.929	0.015	-0.442
Predictors of Intercept												
ADHD Status	-3.384	0.464	0.000	-0.333								
Race/Ethnicity	0.088	0.498	0.859	0.008	-0.153	0.707	0.828	-0.015	0.307	0.705	0.664	0.030
Service Use at Baseline	2.647	0.521	0.000	0.224	2.930	0.799	0.000	0.240	2.398	0.681	0.000	0.235
Predictors of Slope												
ADHD Status	0.090	0.166	0.590	0.031								
Changes in Service Utilization	0.699	0.334	0.036	0.118	0.296	0.558	0.596	0.040	1.008	0.390	0.010	0.220
Race/Ethnicity	0.069	0.178	0.698	0.023	0.124	0.271	0.647	0.037	-0.010	0.229	0.964	-0.004

This table provides basic results by latent analyses model.

Note: The service utilization at baseline and changes in service utilization predictors refer to the educational services (e.g. tutoring, visiting writing center).

Figure 1. Basic Latent Growth Model

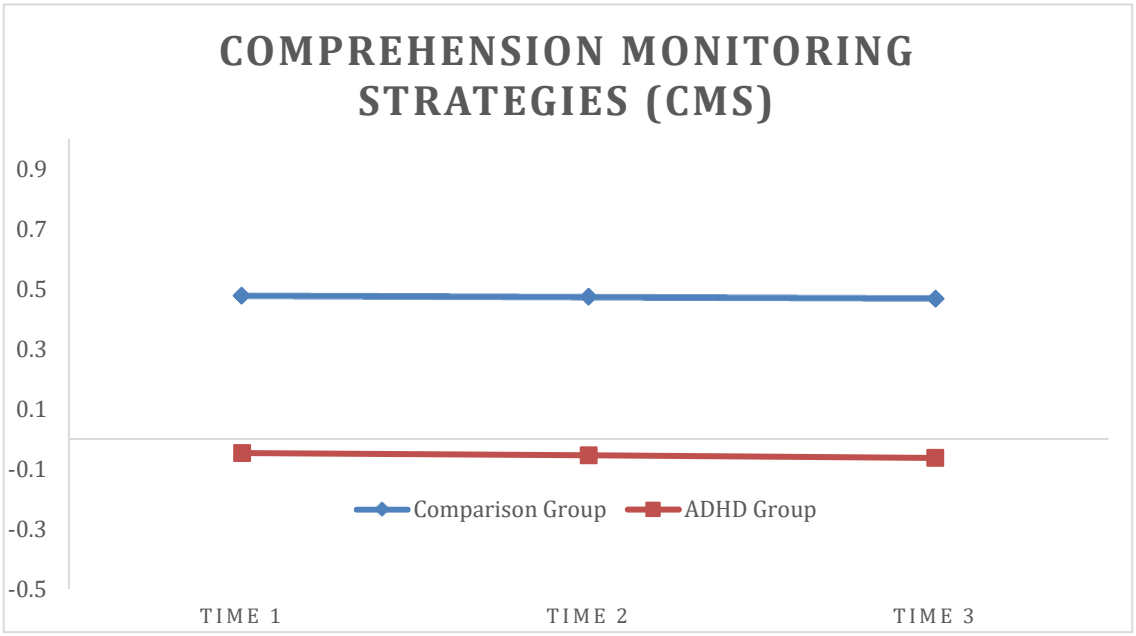


* indicates significance < .05 and ** indicates significance < .01.

A path diagram representing the basic latent growth curve model (model 1) for comprehension monitoring strategies over three time points for college students with and without ADHD. The intercept represents the average scores on the latent variable at baseline. The slope represents the average change over time in comprehension monitoring scores for college students. The predictors in the model are ADHD group status (i.e. ADHD group/comparison), dichotomized race/ethnicity (i.e. non-Hispanic White/students of color), and the latent difference score for service utilization.

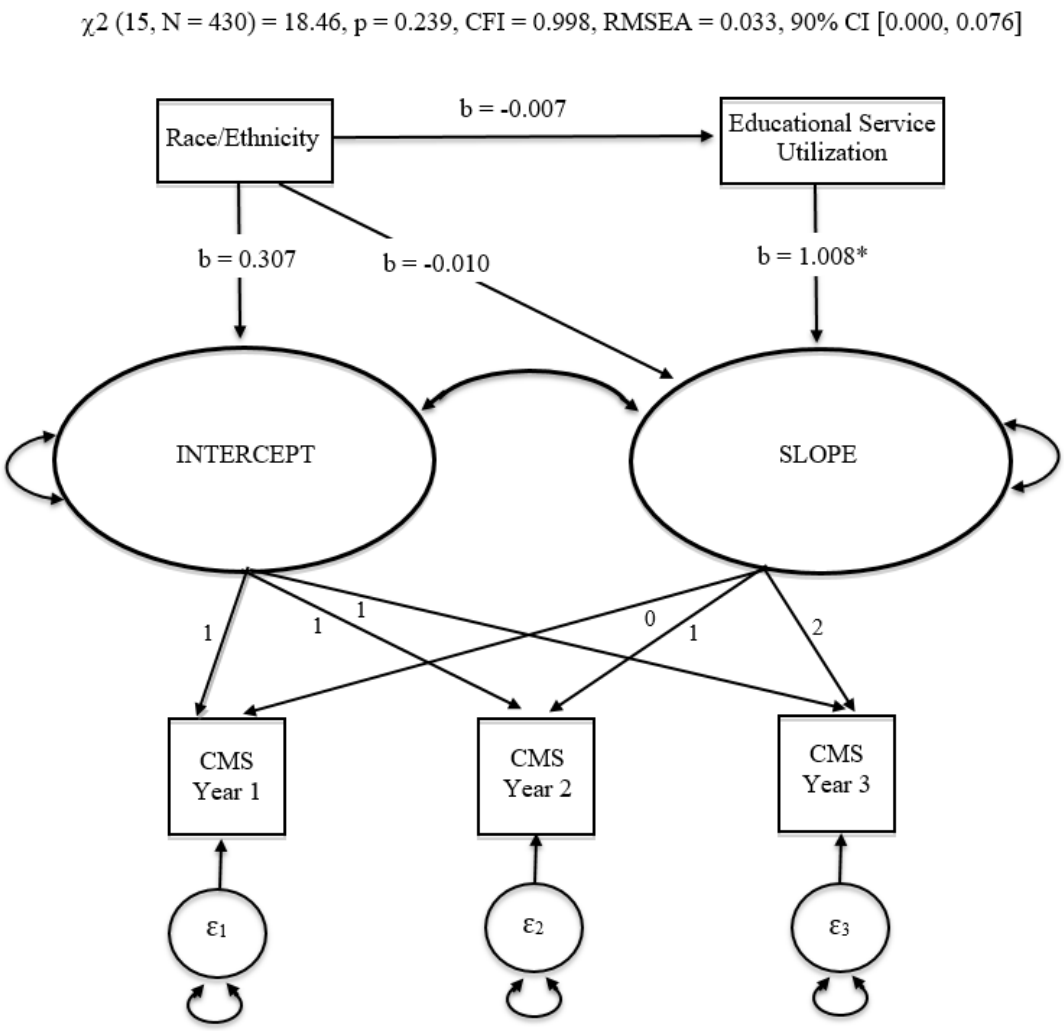
Note: CMS = Comprehension Monitoring Strategies. This latent variable is comprised of three subscales of the LASSI; self-testing, study aids, and information processing.

Figure 2. Comprehension Monitoring Strategies (CMS)



A chart detailing the average change in CMS over time by group status (ADHD/Comparison). This chart was created using the intercept and slope for each group (from the multi-group model) with the designated factor loadings (i.e. 0, 1, 2).

Figure 3. Multi-Group Model: ADHD Group

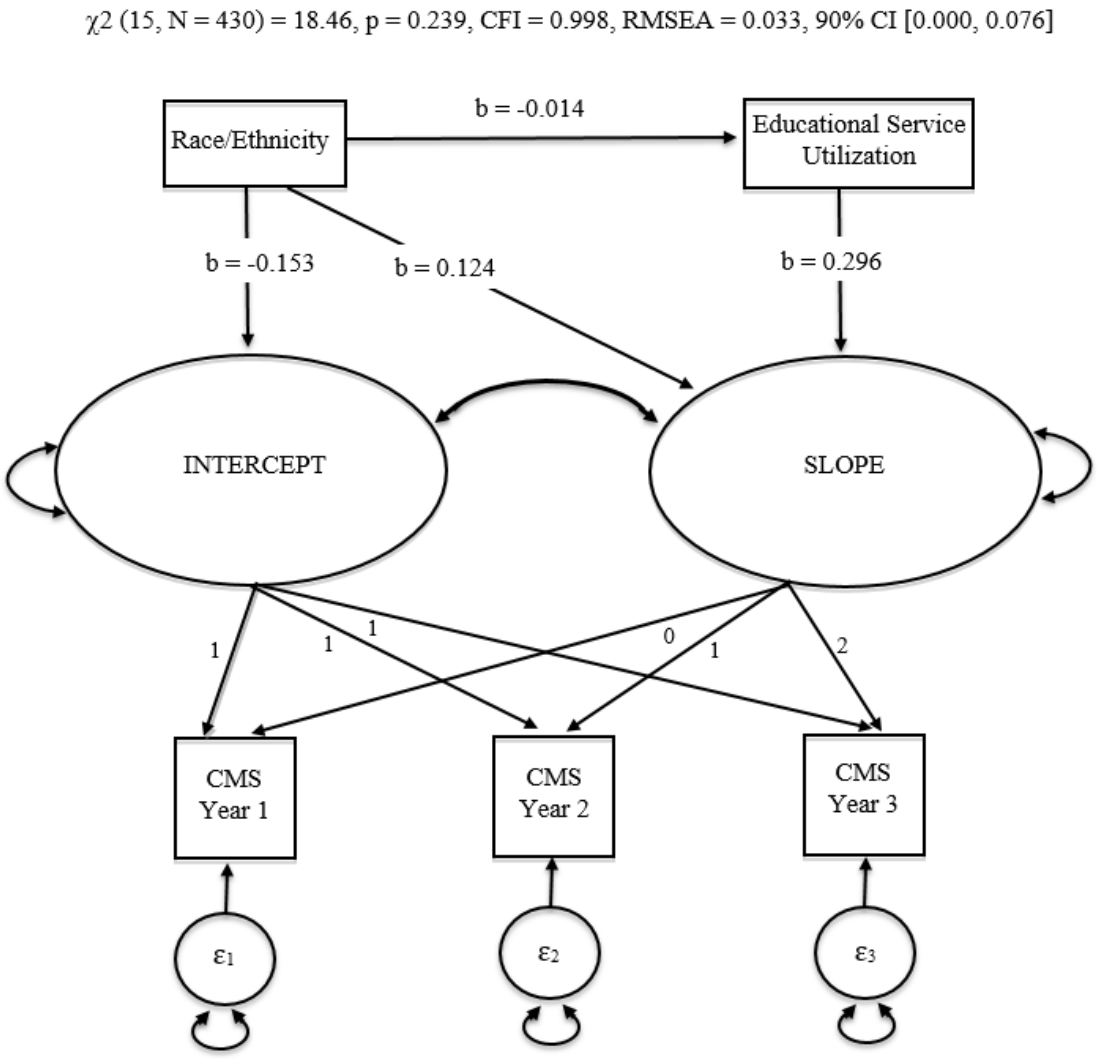


*indicates significance < .05 and ** indicates significance < .001

A path diagram representing the latent growth curve model for comprehension monitoring strategies over three time points for students with ADHD. The predictors in the model include race/ethnicity and the latent difference variable for educational services utilization.

Note: CMS = Comprehension Monitoring Strategies. This latent variable is comprised of three subscales; self-testing, study aids, and information processing

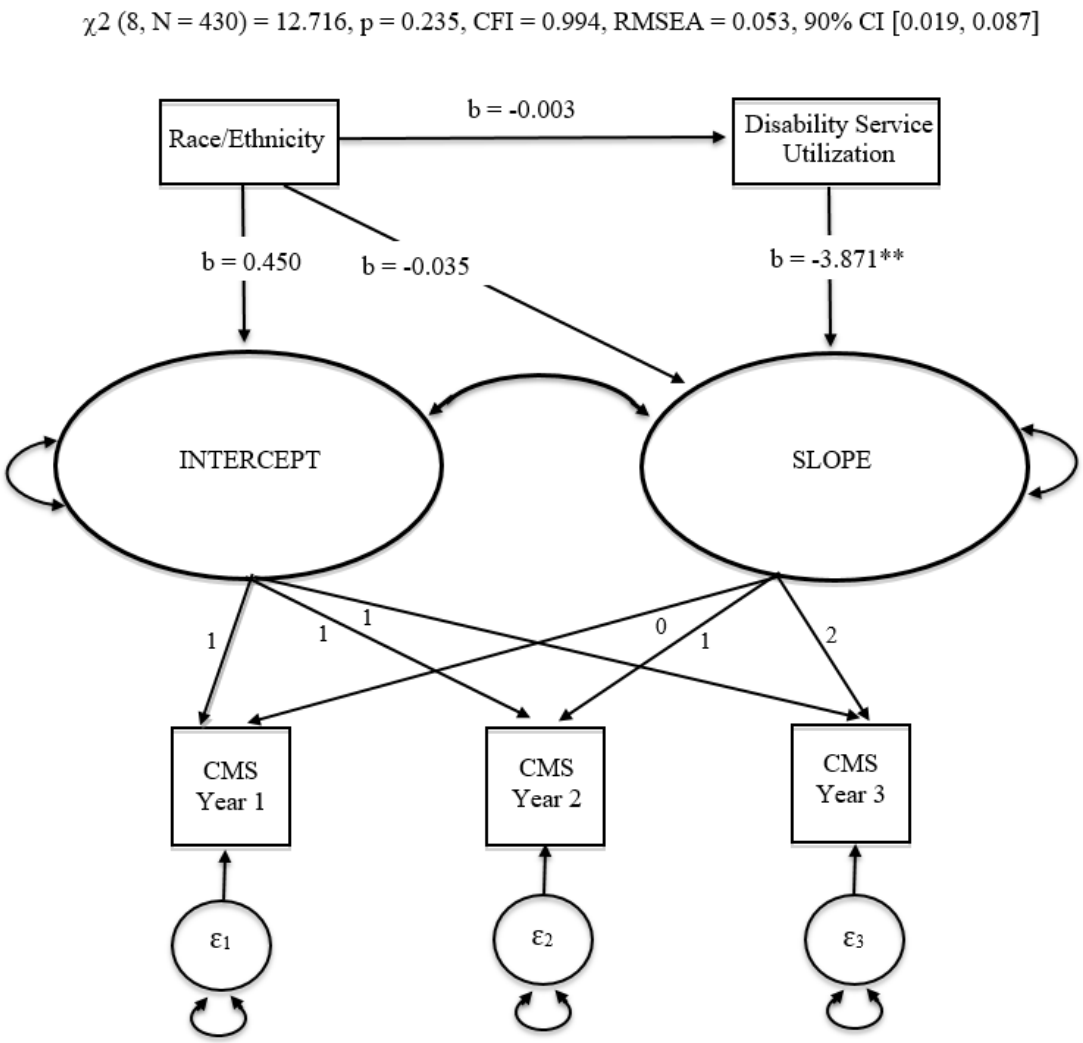
Figure 4. Multi-Group Model: Comparison Group



A path diagram representing the latent growth curve model for comprehension monitoring strategies over three time points for students without ADHD. The predictors in the model include race/ethnicity and the latent difference variable for educational services utilization.

Note: CMS = Comprehension Monitoring Strategies. This latent variable is comprised of three subscales; self-testing, study aids, and information processing.

Figure 5. Latent Growth Model for Disability Services



*indicates significance < .05 and ** indicates significance < .001

A path diagram representing the latent growth curve model for comprehension monitoring strategies over three time points for students with ADHD. The predictors in the model include race/ethnicity and the latent difference variable for disability services utilization.

Note: CMS = Comprehension Monitoring Strategies. This latent variable is comprised of three subscales; self-testing, study aids, and information processing.

APPENDIX C

SCSI

ID: _____
Date: _____

Services for College Students Interview (SCSI)
College Version – Year 2

<u>Directions</u>: I am now going to ask you questions about any help or assistance you may have received since we last met with you, last [fall or spring] semester.

1. ***Not including required meetings, did you meet with a professor or your academic advisor to discuss your academic performance/progress?*** YES NO

If NO, skip to Question #2; if YES, ask:

a. With whom did you meet to discuss most of your concerns? _____
(1 = advisor, 2 = course professor, 3 = other)

b. What was the reason you met with [name of faculty]? _____
(1 = not doing well, 2 = bad test/paper grade, 3 = help with assignment, 4 = other)

c. How many times did you meet with [name of faculty]? _____
(1 = 1-2 times, 2 = 3-4 times, 3 = 5+ times)

d. In your opinion, how well did [name of faculty] listen and try to understand your concerns? _____
(1 = not well, 2 = moderately well, 3 = very well)

e. What assistance or accommodations, if any, did [name of faculty] offer? _____
(1 = none, 2 = studying advice, 3 = extra credit opportunity, 4 = extended deadline, 5 = other)

f. In your opinion, how helpful was this assistance from [name of faculty]? _____
(1 = not helpful, 2 = moderately helpful, 3 = very helpful)

2. ***At any time since last [fall or spring], did you receive campus tutoring services?***

YES NO

If NO, skip to #3; if YES, ask:

a. How many times did you receive tutoring? _____
(1 = 1-2 times, 2 = 3-4 times, 3 = 5 -9 times, 4 = 10 or more times)

b. Are you still receiving tutoring? _____
(1 = still receiving, 2 = stopped receiving)

c. In your opinion, how helpful was tutoring? _____
(1 = not very helpful, 2 = moderately helpful, 3 = very helpful)

3. ***At any time since last [fall or spring], did you receive academic skills assistance (e.g., planners, organization, time management, etc.)?*** YES NO

If NO, skip to #4; if YES, ask:

a. How many times did you receive study skills assistance? _____
(1 = 1-2 times, 2 = 3-4 times, 3 = 5 – 9 times, 4 = 10 or more times)

b. Are you still receiving study skills assistance? _____
(1 = still receiving, 2 = stopped receiving)

c. In your opinion, how helpful was study skills assistance? _____
(1 = not very helpful, 2 = moderately helpful, 3 = very helpful)

4. ***At any time since last [fall or spring], did you receive writing/speaking assistance?***

YES NO

If NO, skip to #5; if YES, ask:

a. How many times did you receive writing/speaking assistance? _____
(1 = 1-2 times, 2 = 3-4 times, 3 = 5 - 9 times, 4 = 10 or more times)

b. Are you still receiving writing/speaking assistance? _____
(1 = still receiving, 2 = stopped receiving)

c. In your opinion, how helpful was writing/speaking assistance? _____
(1 = not very helpful, 2 = moderately helpful, 3 = very helpful)

5. ***During this same time period, did you receive career counseling?*** YES NO

If NO, skip to #6; if YES, ask:

a. How many times did you receive career counseling? _____
(1 = 1-2 times, 2 = 3-4 times, 3 = 5 – 9 times, 4 = 10 or more times)

b. Are you still receiving career counseling? _____
(1 = still receiving, 2 = stopped receiving)

c. In your opinion, how helpful was career counseling? _____
(1 = not very helpful, 2 = moderately helpful, 3 = very helpful)

At any time since last [fall or spring], did you receive <u>formal</u> disability service accommodations?

YES NO

If NO, skip to Question #7; if YES, ask:

Which of the following types of accommodations did you receive? _____

a. Extra time (1 = Yes, 0 = No) _____

b. Private testing room (1 = Yes, 0 = No) _____

c. Note-taker (1 = Yes, 0 = No) _____

d. Technology support (1 = Yes, 0 = No) _____

e. Other (1 = Yes, 0 = No) _____

f. What is the main reason you received these accommodations? _____
(1 = ADHD, 2 = LD, 3 = other emotional/behavioral difficulties)

g. How long did you receive these accommodations? _____
(1 = less than 1 month, 2 = 1-2 months, 3 = 3+ months)

h. How regularly did you use these accommodations? _____
(1 = not at all, 2 = sometimes, 3 = often, 4= very often)

i. Are you still using these accommodations? _____
(1 = still using, 2 = stopped using)

j. In your opinion, how helpful are these accommodations? _____
(1 = not very helpful, 2 = moderately helpful, 3 = very helpful)

6. ***At any time since last [fall or spring], did you take medication for ADHD-related difficulties?*** YES NO

If NO, skip to Question #10; if YES, ask:

a. What is the name of the medication? _____
(1 = MPH, 2 = Amphetamine, 3 = non-stimulant ADHD, 4 = other)

b. Who prescribed or gave you [name of medication]? _____
(1 = primary care physician, 2 = psychiatrist, 3 = other physician, 4 = another student)

c. How long did you take [name of medication]? _____
(1 = less than 1 month, 2 = 1-2 months, 3 = 3+ months)

d. How many times per day did you take [name of medication]? _____
(1 = once, 2 = twice, 3 = 3+)

e. How many days per week were you <u>supposed</u> to take [name of medication]? _____
(1 = daily, 2 = weekdays only, 3 = as needed)

f. How closely did you follow this [name of medication] regimen? _____
(1 = not well, 2 = moderately well, 3 = very well)

g. Are you still taking [name of medication]? _____
(1 = still taking, 2 = stopped taking)

h. In your opinion, how helpful was taking [name of medication]? _____
(1 = not very helpful, 2 = moderately helpful, 3 = very helpful)

Did taking [name of medication] cause any of the following side effects?

i. Loss of appetite (1 = Yes, 0 = No) _____

j. Sleep disruption (1 = Yes, 0 = No) _____

k. Irritability (1 = Yes, 0 = No) _____

l. Other (1 = Yes, 0 = No) _____

7. ***Did you take any other medication for ADHD-related difficulties?*** YES NO

If NO, skip to Question #10; if YES, ask:

a. What is the name of that medication? _____
(1 = MPH, 2 = Amphetamine, 3 = non-stimulant ADHD, 4 = other)

b. Who prescribed or gave you [name of medication]? _____

(1 = primary care physician, 2 = psychiatrist, 3 = other physician, 4 = another student)

c. How long did you take [name of medication]? _____
(1 = less than 1 month, 2 = 1-2 months, 3 = 3+ months)

d. How many times per day did you take [name of medication]? _____
(1 = once, 2 = twice, 3 = 3+)

e. How many days per week were you <u>supposed</u> to take [name of medication]? _____
(1 = daily, 2 = weekdays only, 3 = as needed)

f. How closely did you follow this [name of medication] regimen? _____
(1 = not well, 2 = moderately well, 3 = very well)

g. Are you still taking [name of medication]? _____
(1 = still taking, 2 = stopped taking)

h. In your opinion, how helpful was taking [name of medication]? _____
(1 = not very helpful, 2 = moderately helpful, 3 = very helpful)

Did taking [name of medication] cause any of the following side effects?

i. Loss of appetite (1 = Yes, 0 = No) _____

j. Sleep disruption (1 = Yes, 0 = No) _____

k. Irritability (1 = Yes, 0 = No) _____

l. Other (1 = Yes, 0 = No) _____

8. ***In addition to [name of ADHD medications], did you take any other medication for ADHD-related difficulties?*** YES NO

If NO, skip to Question #10; if YES, ask:

a. What is the name of that medication? _____
(1 = MPH, 2 = Amphetamine, 3 = non-stimulant ADHD, 4 = other)

b. Who prescribed or gave you [name of medication]? _____
(1 = primary care physician, 2 = psychiatrist, 3 = other physician, 4 = another student)

c. How long did you take [name of medication]? _____
(1 = less than 1 month, 2 = 1-2 months, 3 = 3+ months)

d. How many times per day did you take [name of medication]? _____
(1 = once, 2 = twice, 3 = 3+)

e. How many days per week were you <u>supposed</u> to take [name of medication]? _____
(1 = daily, 2 = weekdays only, 3 = as needed)

f. How closely did you follow this [name of medication] regimen? _____
(1 = not well, 2 = moderately well, 3 = very well)

g. Are you still taking [name of medication]? _____
(1 = still taking, 2 = stopped taking)

h. In your opinion, how helpful was taking [name of medication]? _____
(1 = not very helpful, 2 = moderately helpful, 3 = very helpful)

Did taking [name of medication] cause any of the following side effects?

i. Loss of appetite (1 = Yes, 0 = No) _____

j. Sleep disruption (1 = Yes, 0 = No) _____

k. Irritability (1 = Yes, 0 = No) _____

l. Other (1 = Yes, 0 = No) _____

9. ***At any time since last [fall or spring], did you take medication for any other behavioral or emotional difficulties?*** YES NO

If NO, skip to Question #12; if YES, ask:

a. What medication(s) did you take? _____
(1 = mood, 2 = anxiety, 3 = other)

b. What was the main reason for taking [name of medication]? _____
(1 = depression, 2 = anxiety, 3 = anger, 4 = other)

c. Who prescribed or gave you [name of medication]? _____
(1 = primary care physician, 2 = psychiatrist, 3 = another student)

d. How long did you take [name of medication]? _____
(1 = less than 1 month, 2 = 1-2 months, 3 = 3+ months)

e. Are you still taking [name of medication]? _____
(1 = still taking, 2 = stopped taking)

f. In your opinion, how helpful was taking [name of medication]? _____
(1 = not very helpful, 2 = moderately helpful, 3 = very helpful)

10. ***In addition to [name of medication], did you take any other medication for these other types of behavioral or emotional difficulties?*** YES NO

If NO, skip to Question #12; if YES, ask:

a. What other medication(s) did you take? _____
(1 = mood, 2 = anxiety, 3 = other)

b. What was the main reason for taking [name of medication]? _____
(1 = depression, 2 = anxiety, 3 = anger, 4 = other)

c. Who prescribed or gave you [name of medication]? _____
(1 = primary care physician, 2 = psychiatrist, 3 = another student)

d. How long did you take [name of medication]? _____
(1 = less than 1 month, 2 = 1-2 months, 3 = 3+ months)

e. Are you still taking [name of medication]? _____
(1 = still taking, 2 = stopped taking)

f. In your opinion, how helpful was taking [name of medication]? _____
(1 = not very helpful, 2 = moderately helpful, 3 = very helpful)

11. ***At any time since last [fall or spring], did you participate in or receive individual or group counseling/ therapy?*** YES NO

If NO, end Interview; if YES, ask:

a. What kind of counseling/therapy did you receive? _____
(1 = individual, 2 = group, 3 = family)

b. What is the main reason you received [name of counseling/therapy]? _____
(1 = ADHD, 2 = depression 3 = anxiety, 4 = other)

c. Who provided the [name of counseling/therapy]? _____
(1 = campus professional, 2 = off-campus professional)

d. How often did you participate in or attend [name of counseling/therapy]? _____
(1 = weekly, 2 = alternate weeks, 3 = once a month, 4 = other)

e. Are you still receiving [name of counseling/therapy]? _____
(1 = still receiving, 2 = stopped receiving)

f. How closely did you follow the therapy/counseling advice and guidance you received? _____
(1 = not well, 2 = moderately well, 3 = very well)

g. In your opinion, how helpful was [name of counseling/therapy]? _____
(1 = not very helpful, 2 = moderately helpful, 3 = very helpful)

12. ***In addition to [name of counseling/therapy], did you receive any other counseling or therapy?*** YES NO

If NO, end Interview; if YES, ask:

a. What type of counseling/therapy did you receive? _____
(1 = individual, 2 = group, 3 = family)

b. What is the main reason you received [name of counseling/therapy]? _____
(1 = ADHD, 2 = depression 3 = anxiety, 4 = other)

c. Who provided the [name of counseling/therapy]? _____
(1 = campus professional, 2 = off-campus professional)

d. How often did you participate in or attend [name of counseling/therapy]? _____
(1 = weekly, 2 = alternate weeks, 3 = once a month, 4 = other)

e. Are you still receiving [name of counseling/therapy]? _____
(1 = still receiving, 2 = stopped receiving)

f. How closely did you follow the therapy/counseling advice and guidance you received? _____
(1 = not well, 2 = moderately well, 3 = very well)

g. In your opinion, how helpful was [name of counseling/therapy]? _____
(1 = not very helpful, 2 = moderately helpful, 3 = very helpful)